THE JOURNAL OF SCHOOL HEALTH

Vol. IX NOVEMBER, 1939 No. 9

CONTENTS

The School and the Child With Heart Disease 253
Herbert W. Schmitz, M.D.

The School and Rheumatic Heart Disease 260
Harry B. Silver, M.A., M.D.

The Value of Tuberculin Skin Tests in a School Program 263
William E. Ayling, M.D.

Tuberculosis in Children 271
Dr. Philip E. Sartwell

Editorials 273

Charles L. Outland, M.D., President 275

Abstracts 276

Review 286

THE JOURNAL OF SCHOOL HEALTH

Published monthly, except July and August, at Buffalo, N. Y.

THE AMERICAN SCHOOL HEALTH ASSOCIATION
3335 Main St., Buffalo, New York

Editor
CHARLES H. KEENE, M. D.
3335 Main Street, Buffalo, N. Y.

Assistant Editor
EARL E. KLEINSCHMIDT, M. D.
Loyola University, Chicago, Ill.

SUBSCRIPTION RATES TO THE JOURNAL
Membership dues, $2.00, including $1.75 subscription. Subscription $1.75.
Single copies 25c

Address all communications to
THE EDITOR, 3335 Main Street, Buffalo, New York

Copyright, November, 1939, by
The American School Health Association

Entered as second-class matter at the Post-Office at Buffalo, N. Y.
October 5, 1937

6% of your pupils have hearing defects—

CAN YOU FIND THEM?

The 4C Audiometer CAN!

. . . rapidly . . . scientifically

AUTHORITATIVE surveys indicate that 6% of the country's school children have impaired hearing.

A student who cannot hear clearly is very likely to fall behind in classroom work—wasting years of his life—costing your school system money through having to repeat grades. You can help to check this double loss with a Western Electric 4C Audiometer.

It plays special records—as many as 40 children listen simultaneously through headsets—write down what they hear. You check their papers against a master sheet—see at a glance each pupil's hearing lo The entire test takes only about 20 minutes.

Send the coupon today.

Western Electric
AUDIOMETER

GRAYBAR ELECTRIC CO. JSH—11-39
Graybar Building, New York, N. Y.

Gentlemen: Please send me details of the Western Electric 4C Audiometer.

NAME .....

ADDRESS .....

CITY ..... STATE .....

THE JOURNAL OF SCHOOL HEALTH

Devoted to the interests and advancement of school health service and instruction. Your participation by membership is solicited.

Vol. IX NOVEMBER, 1939 No. 9

THE SCHOOL AND THE CHILD WITH HEART DISEASE*

HERBERT W. SCHMITZ, M.D.

Cardiologist, School Health Service, Yonkers, N. Y.

The school child suffering from heart disease presents an important and difficult medical and health problem. It has been estimated that approximately 0.6% of all children of school age in New York State have organic heart disease. That means that at least 15,000 school children in this state suffer from cardiac disease, and that about half of these are in New York City alone. Communities with a school population of 50,000 would have about 300 children with cardiac disease; communities with 25,000 half that number, and so on. It is not generally appreciated that heart disease causes more disability and crippling in children than any other disease. Its incidence is higher than that of infantile paralysis, diseases of bones and joints, or tuberculosis. The mortality rate from heart disease among school girls in New York City is higher than that of any other illness, and among school boys it is second only to accidents.

These statistics indicate the importance of heart disease among school children, especially from the standpoint of incidence, disability, and mortality.

Children with orthopedic defects have received considerable attention from the State Department of Health and from schools in the larger communities. The cardiac cripples, however, have received very little attention thus far, although in some communities the school authorities have recognized the need of special supervision and care of children with damaged hearts.

To understand the medical needs of the school child with a crippled heart requires a thorough understanding of the natural history and evolution of the disease which causes the heart damage. Rheumatic fever is the cause of 90 per cent or over of all damaged hearts in children. It is important therefore to understand the nature and course of rheumatic fever and the cardiac involvement that invariably results. Rheumatic fever is an infection, the exact cause of which is not definitely known although it is believed by many to be due to a streptococcus. It is more common in the crowded sections of our cities, and in families belonging to our

* Read at the annual meeting of the New York State School Physicians' Association, Saratoga Springs, June 26, 1939.

lower income groups. Very few cases are found in private schools, as compared with the number found in our public and parochial schools. The social and economic status, overcrowding, poor housing, malnutrition, exposure to cold, and fatigue are all important factors in the occurrence of the rheumatic infection. Climate also appears to play a significant role in rheumatic fever. The incidence of initial and recurrent attacks is highest in the winter and spring months in northern climates. In the summer months the onset of an acute attack is exceedingly rare, and in southern climates the incidence of rheumatic fever and rheumatic heart disease is very low.

Rheumatic fever may have a sudden onset, but quite often it is insidious. Very often the acute onset is preceded by a pharyngitis which is caused by a hemolytic streptococcus infection. A week or two later the signs and symptoms of an acute rheumatic infection may appear. In some cases a typical polyarthritis, pain, swelling, redness, and stiffness of joints is the outstanding manifestation. In others, the joint symptoms are very mild and fleeting, and in still others there is no noticeable joint involvement but only the usual signs of an acute infection, such as an elevated temperature and accelerated heart rate, and quite frequently a gallop rhythm. In a certain number of cases there is no acute illness, and the active disease process may have been present for weeks or months before its presence is detected. These children may appear listless. They may have a poor appetite. They are usually pale and somewhat anemic, and lose weight, or are unable to gain weight. Examination will often reveal a low grade temperature, rapid heart rate, an increased blood sedimentation rate, and often elevated leucocyte count. Chorea, which is considered a rheumatic manifestation, may be followed in a small percentage of cases by some cardiac involvement.

The rheumatic infection usually runs a chronic and progressive course. In this respect it is quite different from such diseases as pneumonia, typhoid fever, or other infectious diseases of childhood. Although its onset may be acute, the infection may persist not only for weeks, but often for months, and in some cases for a year or more. As long as the infection remains active, even in the absence of acute signs or symptoms, continued structural changes in the heart may be expected. This chronic and smouldering nature of the infectious process cannot be emphasized too strongly, for treatment and supervision cannot be carried out intelligently unless that fact is recognized and clearly understood. Another important and significant feature of the rheumatic infection is its tendency to recur, so that in some cases as many as six or more attacks may occur. The mode of onset of the recurrent attack is the same as the onset of the initial attack. It is usually preceded by a pharyngitis

and a positive hemolytic streptococcus throat culture, but prominent joint symptoms are not commonly observed.

During the stage of active infection, the heart usually suffers a certain degree of damage. Rarely does it escape involvement entirely, unless there have been only one or perhaps two very mild and short attacks of rheumatism. But a so-called mild attack is not necessarily a guarantee against cardiac involvement, for often advanced rheumatic heart disease is discovered in children who give only a vague history of rheumatic infection. During the acute inflammation of the heart all structures may be affected, the endocardium, myocardium, and pericardium, but it is the endocardium lining the heart valves which suffers the greatest permanent damage. During this acute phase, the child may be very ill, and may present all the signs of congestive heart failure, and, in rare instances, may even succumb to the illness. Most children, however, eventually recover from a first and even second attack. After the infection subsides, which may require months and in some cases a year or more, the lesion or lesions in the heart are repaired. The myocardium recovers almost completely, and the pericardium rarely suffers severe permanent damage, except in a small number of cases which may develop chronic adhesive pericarditis. The greatest damage occurs to the heart valves, particularly the mitral and aortic valves. During the process of repair, deformity of the valves results. With each subsequent or recurrent attack the damage to the valves increases, and eventually varying degrees of insufficiency and constriction occur. As a consequence of the insufficient and stenosed valves, the work of the heart is considerably increased, and gradually the heart muscle hypertrophies and the heart becomes enlarged. The damage to the heart may sooner or later interfere with its functional efficiency, and this varies according to the extent of the cardiac damage.

Rheumatic heart disease may thus be divided into two important stages. The first is the stage of active infection and acute inflammation of the heart affecting chiefly myocardium and valves and which may frequently lead to varying degrees of heart failure. The second is the valvular damage of the mitral and aortic valves, which is the result of the inflammatory process. This damage is a permanent one and persists even after the rheumatic infection has become quiescent.

At the present time there is no specific prophylactic treatment of rheumatic fever such as has been used successfully against smallpox, typhoid fever, and diphtheria. It is the hope that some day something worth while may be accomplished in the way of prevention of rheumatic infection, and thus may be reduced the incidence of the most important crippling disease of childhood. Very little has been attempted in this direction, although we are aware of a number of factors that play a significant role in the

occurrence of this disease. The main reason for this lack of interest on the part of laity, school authorities, and some public health officials is the relatively undramatic nature of rheumatic heart disease as compared with other crippling diseases such as infantile paralysis, or tuberculosis.

The treatment of rheumatic heart disease is based on a thorough knowledge of the natural history of the disease, the structural heart damage that exists, and the manner in which such structural damage may affect the functional capacity of the child. Unfortunately there is no specific therapy for rheumatic infection. The treatment consists essentially of intelligent management and supervision. The important fact to remember is that in every stage of the illness constant medical supervision and guidance is essential. In other words, any child who has had rheumatic fever, no matter whether only one or more attacks, should be examined periodically and watched continuously for the possible development of a heart lesion, for the possible progression of an existing cardiac condition, and for the possible appearance of a new infection. During the acute stage, treatment in bed is necessary, and that is also true in a limited way for those children who no longer present symptoms of active mischief, but are shown by various laboratory procedures to have a smouldering infectious process. After the infection has subsided, the child is often anemic, poorly nourished, and has a reduced tolerance for exercise. During the so-called period of convalescene, continued supervision in the home or preferably in a convalescent home is necessary. Recovery from the active infection does not mean recovery from all the effects of the disease. Varying degrees of heart damage nearly always remain, and this may restrict the child's capacity for physical activity. These children should be classified according to their response to effort, and the physical activity permitted each child should be based on this classification. Some of these children will be able to carry on like the average normal child, others may need to restrict their activities only slightly, while still others may be equal to very little physical exertion.

A useful classification to follow in this respect is that devised by the New York Heart Association. According to this classification children with heart diseases are divided into three classes:

Class 1—Patients with organic heart disease able to carry on ordinary physical activity without discomfort.

Class 2—Patients with organic heart disease unable to carry on ordinary physical activity without discomfort.

A. Activity slightly limited.

B. Activity greatly limited.

Class 3—Patients with organic heart disease and with symptoms of cardiac insufficiency at rest, unable to carry on any physical activity without discomfort.

It is obvious that a child does not necessarily remain in one class indefinitely. For this reason the functional efficiency of a child with heart disease must be determined periodically, and its daily routine prescribed accordingly.

The public schools of the larger communities should take an active part in the supervision of the child with heart disease. The schools also have an excellent opportunity to assist and cooperate in a general attack against rheumatic fever. Through reliable examinations in school it would be possible to learn about every cardiac child of school age in the community. The investigation could then be continued and extended to the home by public health authorities and social agencies.

The medical aspects of the case of the school child with heart disease are many and complicated, and should be under the direction of a qualified physician, cardiologist, or a diagnostic cardiac clinic. The first and probably the most important requirement is the correct diagnosis of heart disease and the grouping or classification of the children according to their functional capacity. This cannot be satisfactorily done by the family physicians and the various hospital clinics because many of them lack the necessary training, but it should be done in school and by a trained physician, for only in this way can uniformity in diagnosis and classification of these children be accomplished. Unless this procedure is followed many grave mistakes will be made, and many a child with a normal heart will be labeled a cardiac case and treated as such, and some children with mild cardiac disease will be unnecessarily restricted, and again other children with active disease or other serious heart involvement might be overlooked entirely. During the pre-school examination and the routine yearly physical examination most of the cases of cardiac disease will be detected, but along with these will be grouped many children who have no organic heart disease but only a functional or accidental murmur. Many children have heart murmurs, but not all heart murmurs signify valvular disease. It is my opinion that at least 5 per cent of all school children examined have heart murmurs, but only about 0.6 per cent have cardiac involvement. The differentiation between murmurs that indicate heart disease and those that are not associated with cardiac damage is not always easily made, and often requires the aid of careful history taking and fluoroscopic examination. It is inexcusable to fail to diagnose heart disease when it is present and thus deny the child the supervision it requires, but it is equally inexcusable to diagnose heart disease in a child when actually no heart involvement is present.

The best procedure to follow is to re-examine all children who were found to have heart murmurs during the routine examinations. As a result of this examination there will be found three main groups: one large group with murmurs but no organic dis-

ease, another group with a definite history of rheumatic infection but no obvious heart involvement, and a third group with definite evidence of cardiac disease. The children belonging to the first group need not give us any concern. They need not be supervised, and they should attend the regular classes, for they are normal children. The children in the second group or the children with a rheumatic history should be kept under obeservation. They may also attend the regular classes, but they should be known to their teachers, and the school nurse. They should be watched for the possible development of respiratory infections, or a recurrent rheumatic infection. Any appearance of ill health should be reported to the school nurse, school physician, and family physician. They should be examined at least twice a year. The children in the third group have organic heart disease, and since they differ in their functional capacity they will need to be classified according to their response to effort.

Children belonging to Class I, that is children with organic heart disease but able to carry on normal physical activity without discomfort, may engage in the ordinary physical activities of childhood without danger of aggravating the existing cardiac condition, and they may attend the regular classes in school with the normal children. It is advisable, however, not to allow them to engage in competitive sports and the too strenuous forms of exercise. The teacher must be familiar with the child's condition, and should report any illness or disability to the school nurse and school physician. The possibility of the appearance of a new rheumatic infection must be constantly borne in mind, for it is a recurrent infection rather than physical activity that nearly always increases the cardiac damage. These children should be examined at least every 6 months, some cases oftener, to see if any change in the cardiac status has occurred. Transportation to and from school is not necessary for these children.

Children in Class II-A are moderately handicapped. Running, stairclimbing, and active games cause breathlessness, palpitation, or fatigue, and sometimes chest pain. They need to be restricted in their activities, and they must be taught to keep within the limits of their functional capacity. These children present a greater school problem than those in Class I. They can go to school, but they require special supervision. Special cardiac classes are particularly desirable for these children, and the larger communities should make every effort to provide them. These children may find the daily routine in a large public school system too strenuous, and the development of new trouble might easily be overlooked.

A physician trained in rheumatic heart disease should be assigned to the cardiac classes, and he should make periodic visits in order to inspect the children and to reexamine and reclassify them at least twice a year. The physician should also be qualified to give

lectures to the teachers, school nurses, and even to the children and their parents on the nature of rheumatic fever and rheumatic heart disease, and instruct them particularly in the early detection of this disease. The cardiac classes should be visited at least twice a week by a qualified nurse. She should keep records of the temperature, pulse, and weight, and note and report any signs of illness to the school physician and family physician. The teachers should also have special training in the care of school children with cardiac disease. The department of education should provide daily transportation to and from school for most of the children, and well ventilated, bright, and easily accessible rooms for the cardiac classes. Rest periods in school, and for special cases supplementary nutrition, should also be provided. The department of education should also provide supplementary teaching for these children. In this manner a child who is ill at home for several months can readily keep up with its school work.

In the smaller communities, in which the number of children with heart disease is very small, the child in Class II-A can attend the regular classes; however, special allowances should be made for his disability by both principal and teacher. The school nurse and teacher should supervise his activities, and a record should be kept of his weight, temperature, and pulse at least once a week. Any indication of ill-being should be reported to the school physician and family physician.

Children in Class II-B and Class III have marked cardiac damage, and are unable to attend school. Home teaching, however, is desirable for some of the children belonging to Class II-B.

Special classes for children in high school are probably not practical, and not nearly so important as for the younger children. These children should, however, be supervised by the teacher, nurse, and physician, in very much the same manner as the other rheumatic cardiac children. They should be protected against overexertion as much as possible.

I have tried to outline rather briefly the major medical requirements of the school child with cardiac disease, and have given suggestions for meeting these special requirements. It is hoped that the public schools of the state will recognize the needs of these children and will establish uniform standards for the diagnosis, care, and supervision of all children with cardiac disease.

* * * * *

City Health Award,—In the city health contest for the year 1938, sponsored by the U. S. Chamber of Commerce in Co-operation with the American Public Health Association, the first award for cities of its population class (50,000 to 100,000) was won by the city of Newton, Mass. Congratulations to H. D. Chope, M. D., Director of Public Health of that city, a Fellow of the American School Health Association, and an active member of the Editorial Board of this Journal.

THE SCHOOL AND RHEUMATIC HEART DISEASE

HARRY B. SILVER, M.A., M.D.*

There had been a great awakening of interest within recent years in the problem of rheumatic heart disease and its management. To those of us engaged in school work it frequently becomes necessary to provide either for lay boards of education or for interested lay groups, a short talk or an outlined brief which will include our recommendations for school participation in the management of the cardiac child. Any attempt of this sort, in order to be successful, must be completely denuded of all technical terminology. It must be brief, authoritative, and sufficiently complete to give to the intelligent laymen a fairly good idea as to the incidence, prognosis, and methods of treatment of rheumatic heart disease in childhood. At the same time, it must carefully avoid all controversial questions both as to the disease itself, and its management. It should attempt to lay simple easily understandable facts before the board, and at the same time avoid too definite recommendations as to policy.

In order to supply this demand, I have attempted to outline very briefly the essential points in a cardiac program in the school. These topic headings may be utilized either as a basis for a talk to the board, or may be submitted in writing with the idea that the board if interested may obtain further information on any particular questions that arise.

I. Rheumatic Fever:
Rheumatic fever is an infectious disease of prolonged duration affecting many organs but particularly the heart. Its onset may vary from frank articular rheumatism with swollen joints, etc., to an onset practically without symptoms. The usual onset in this community is with a sore throat or a fever of short duration. The most important features are the periods of remission and reactivity that extend over many years.

II. The Cause of Rheumatic Fever:
The actual infective organism has not been definitely determined. Undoubtedly the Haemolytic Streptococcus, one of the infective organisms in many of our ordinary sore throats, plays an important part.

III. Rheumatic Heart Disease:
Although rheumatic fever involves many of the organs of the body and all parts of the heart, the greatest damage is due to involvement of the heart valves. This creates in addition to the infectious process a mechanical difficulty. Reinfection increases this mechanical difficulty and in most cases the disability from which the child suffers is due predominately to mechanical factors.

*Theresa Grotto Residential School for Cardiac Children, Caldwell, N. J.

IV. Age of the Incidence of Rheumatic Heart Disease:
With the increase in detailed studies, the age of onset of rheumatic heart disease according to the best available statistics is being constantly reduced. At the present time, it is believed that the great majority of all cases of rheumatic heart disease are acquired either in the pre-school age or in the first two or three years of school life.

V. Incidence of Rheumatic Heart Disease:
Statistical surveys in New York's metropolitan area give incidence of over 1% during school age. The period of greatest activity, which includes the onset in more than 80% of all cases, is between 5 and 13 years. Primary heart involvement in rheumatic fever after 20 years is very rare. In a recent survey between 40 and 50 per cent of the known cases of rheumatic heart disease was first discovered by school physicians.

VI. The Value of a Survey:
1. To determine a statistical incidence of the disease.
2. To determine the regions and groups most frequently arrested.
3. To determine the individual cases:
   a. For the provision of adequate medical supervision.
   b. For the proper coordination of the school program.
   c. For educational work with the child and the family in the management of the disease.
   d. For the direction of the vocational training.

VII. The Mortality of Rheumatic Heart Disease:
In the school age group, it is from three to five times as great as from tuberculosis. Ten years from the discovery of the lesion, the mortality is about 27%.

VIII. Causes of Death:
There are two important factors:
a. Mechanical disability due to the lesion in the heart.
b. Reinfections with additional mechanical damage.

IX. These factors are accessible to control by the school system because:
a. The school by its control of the activities of the child in the school itself, and by intelligent education of both the child and the parents, can reduce the activities of the child to the limits of its individual heart ability. (Mechanical.)
b. Reinfection may be controlled by controlling the factors that tend to bring it about.
   1. Over-exhaustion.
   2. Over-exposure to inclement weather.
   3. Extra protection against classroom infections, crowding, colds, insufficient ventilation, etc.

4. Immediate recognition of even mild infections, with isolation and proper supervision.

X. The trained personnel in most school departments is adequate, provided they are furnished with consultive facilities. The necessary additional equipment should include electrocardiographic and fluoroscopic apparatus under the supervision of a competent cardiologist, who would act as consultant.

XI. Functions of the School Cardiac Program:

1. To identify the cardiac child and control its activities.
2. To set up a long time program for school management.
3. To be available to the family physician for cooperative planning of the child's life.
4. To cooperate with the department of child guidance in the management of the emotional and vocational problems.
5. To act as a teaching center for school physicians, nurses, teachers, etc., in the control of the cardiac child.
6. To evaluate and coordinate reports of the family physicians.
7. To arrange for limited schooling, home teaching, etc.
8. To determine the necessity of transportation to and from school.
9. To coordinate the school system with hospitals, residential schools, clinics, and the private physicians.

XII. Educational Program:

An extensive educational program directed at the families of the cardiac children, that will be widened so as to include the scholastic, social, emotional, and physical sides.

* * * * *

School Enrollment Drops In Chicago,—Statistics compiled from records of the Chicago Board of Education, the Catholic Board of Education, and the Cook County superintendent of schools indicate that the birth-rate drop has cut the scholastic roll by 100,000. The decline is attributed by authorities of all three bodies to the declining birth rate. In 1927 the birth rate in Chicago was 19.6 births for every 1,000 persons In 1933 it dropped to 13.4, and in 1938 it increased to 14.3.

In 1928 there were 614,262 elementary-school pupils in Cook County. Today there are 514,064. The greatest decline has been in the Chicago public elementary schools, which had 363,920 in 1928, and 291,527 in the last school year. This is a drop of 19.9 per cent. In the Catholic schools the decline in enrollment has been 12 per cent.

The decrease in the Chicago schools is attributed not only to the declining birth rate but also to migration of families to the suburbs. The American School Board Journal, July, 1939, p. 93.

THE VALUE OF TUBERCULIN SKIN TESTS IN A SCHOOL PROGRAM*

WILLIAM E. AYLING, M.D., Syracuse, New York
(Health Director, Syracuse Schools; Assistant Professor of Public Health, Syracuse Medical College)

It has taken considerable time to understand the full implications and the enormous value of the tuberculin test, but it now has been made the basis of most diagnostic campaigns.[1] In spite of recent publications,[2] most authorities agree[3] that this test serves as a screen to select those who have been infected through direct exposure and who should be carefully examined and kept under close observation thereafter for development of clinical disease.

It has been repeatedly shown that the tuberculin test is at least on a par with the x-ray examination in eliminating negative cases.[4] It is now known that an individual may have a negative reaction when there is x-ray evidence of some calcium deposits in regional lymph nodes, in the course of certain acute infectious diseases, particularly measles, and in terminal stages of tuberculosis.[5] A positive reactor may become negative if all lesions have healed. These facts in no way detract from the value of the tuberculin test for case-finding purposes.

Through its use has come the knowledge that a tuberculous infection does not mean tuberculous disease, and the further fact that first infection takes place largely in the early years of life, while disease manifests itself most often after adolescence.

Tuberculosis is still the leading cause of death in this age group—15 to 40—which is economically and biologically the most productive period of life. It is an infectious disease and is therefore preventable. Although infection is fairly common and disease comparatively rare, those children who react during childhood furnish a large proportion of the active cases in later life.

This has shown the desirability of knowing the incidence of infection in a community and has led to the plan of testing children in the schools. The tuberculin test is easily administered and the cost is small.[3] By its use those needing x-ray can soon be selected. In recent years there has been a marked reduction, as much as 50 per cent in some localities[6] in the number of positive reactors. In Syracuse the reduction has been from 34.7 per cent in the school year 1934 to 1935, to 23.5 per cent this year, in the same grades. This indicates a decrease in the incidence of this disease.

Very few reactors among children in the lower grades show evidence of active disease, but when examinations are made in the high schools, then disease begins to manifest itself.

* Read at the Annual Meeting of the Medical Society of the State of New York, Syracuse, April 26, 1939. Reprinted from New York State Journal of Medicine, August 1, 1939, p. 1463.

Searching for tuberculosis among apparently healthy children, such as are in daily attendance at school, is valuable from at least four standpoints:

1. The *education* of children and parents as to the importance of this disease and the means of its prevention and cure.

2. *The individual welfare of the child;* active disease discovered early is quickly cured.

3. The *protection of public health* by excluding from school any active cases found, and placing them under proper supervision so that the disease will not be spread by them.

4. It may lead to unknown cases of active tuberculosis that were the *sources of the infections.*

With these facts in mind, the Syracuse School Health Service has, for the past five years, carried on tuberculin testing and x-ray examinations of positive reactors in the local high schools.

The procedure has been first to use all available means, such as the radio, the press, the movies, lectures to parent-teacher groups and other organizations, together with the distribution of form letters and pamphlets, to acquaint pupils and parents with the importance of tuberculosis, its early discovery, and its control and cure. Our efforts were most successful where full cooperation of the school principal and his teaching staff was obtained. By working through them, they themselves became well informed about this disease and in turn spread the information to others. The educational value of this procedure is, we feel, of very great importance to the whole community.

In our previous campaigns we have varied the grades tested somewhat, and from our results decided that the 11th and 12th, i.e., junior and senior high school pupils, furnished the most fertile field for our endeavors. Dr. Lees,[7] of Pennsylvania, reports finding about sixteen times as many cases in this age group (16 to 20 years) as in younger children. We plan to confine our testing to these in the future, retesting pupils previously negative, as well as those never tested before.

The next step in our procedure is to give to pupils in these grades a form letter telling about the test, with a request slip attached. This is accompanied by a pamphlet explaining the tuberculin test and the reason for the x-ray. The signed request is returned to the school if the parent wishes the child to be tested and x-rayed. Our average response is 54 per cent of the registration.

The actual tuberculin testing is done in the schools, according to a schedule arranged in the early fall, so as to reach all the high schools during the school year, both public and parochial. The one-test method is employed, using a 1/1000 solution of old tuberculin, giving 1/10 cc. or 0.1 mg. by the Mantoux technic.

We feel that the one-test method is the only practical one for use in school work and that it is unlikely that any cases of significance are missed. Dr. John Korns,[8] in a report of the work in Cattaraugus County in 1933, found about one-tenth more reactors by using a second test of a full mg. (1.0) strength, but this additional 10 per cent practically never showed x-ray evidence of disease.

The tests are read after forty-eight hours and each pupil receives a slip stating the findings—for negatives, "no evidence of tuberculous infection," or for positives, stating "positive, indicating need of x-ray"—which he takes home to his parents.

For every positive reactor, a history sheet is made out, on which is recorded the family history, past and present symptoms, if any, and any history of possible contact.

All positive reactors are given the opportunity of having chest x-rays at school, although an increasing number go to their own roentgenologist for this service. A fee of $1.00 toward the cost is requested, but not obligatory for those unable to pay. All x-rays are numbered and dated by lead numbers as they are taken.

After developing, the x-rays are sorted and the proper history sheet placed with each one. All the data are reviewed when each film is interpreted. A summary of the history, the reading, diagnosis, and recommendations is taken down by a medical secretary in shorthand and later typewritten on a record sheet for filing. A copy of this record goes to the family physician in each case where a physician's name has been given on the history sheet, and the chest clinic receives a record of every case.

All films are filed at the school health office and are available to the family physician or chest clinic.

For simplicity, the cases are classified according to the diagnosis as to activity:

Class A—essentially negative—no evidence of active pulmonary tuberculosis;

Class B—apparently healed childhood type;

Class B2—suspicious of activity;

Class C—probably active.

An appropriate letter is sent to the parents of each child, directing them to take him to his doctor or to the chest clinic for advice and treatment.

The school nurse delivers the notification letter to the home in all "C" (apparently active) cases and discusses the pupil's condition with the parents, stressing the necessity for immediate medical attention. All showing parenchymal involvement are excluded from school.

All cases are followed by nurses for at least two years. When pupils leave school (graduate or discontinue) the home supervision records are transferred to the generalized nursing bureau. Pupils

moving out of the city to the country are referred to the outpatient department of the county sanatorium.

The value and success of this or any similar tuberculosis case-finding campaign is dependent to a great extent upon the assistance and cooperation of the medical profession as a whole. To make satisfactory headway the profession must assume the same responsibility for tuberculous patients that it does for patients suffering from other diseases. We recommend careful follow-up and care of all cases found to be positive reactors, and stress the importance of tuberculin tests, or x-rays, of all members of the household in an endeavor to ascertain the source of infection.

In the annual report of the Los Angeles County Health Department, California, for 1938, Dr. H. O. Swartout[9] tells how, in a follow-up service in which six additional county nurses were employed, the families of positive reactors were interviewed and offered the tuberculin test and x-ray through the county health department clinics. Out of 1,998 persons tested, 927 were positive, 841 were x-rayed, and 25 active cases found—almost as many as in the school survey, where testing 9,556 pupils resulted in finding 28 active cases.

Apparently in Los Angeles County this work was done on all classes of patients, private as well as clinic, regardless of their financial status. The method was a success in that several previously unknown spreaders of disease were found, but I am wondering what the reactions of the private physicians and roentgenologists were.

In our work in Syracuse we refer all cases back to the family physicians and ask them to check on the other members of the household for the source of infection. To my knowledge there has been more discovered here, although other members of the family who have been school pupils have had x-rays taken in school and some of these were found to have positive findings.

However, the death rate in Syracuse from tuberculosis has been reduced from 59 per 100,000 in 1927, to 29 in 1937 (within a ten-year period). There is no reason to believe that a decrease to 10 per 100,000, or even complete eradication of the disease, is unattainable, but this will depend upon the intensification of present methods of control, particularly the finding of cases in the early stage of the disease.

The case-finding program in school is particularly valuable for this reason, inasmuch as the cases found are almost all in the minimal stage.

Conclusions

A tuberculosis case-finding survey in school is valuable because it spreads the knowledge of the control of tuberculosis (it is a form of health education). It finds cases early, and thereby prevents disability and the expense of long treatment. In a measure it

protects public health by preventing spread of infection and it may lead to the discovery of other unknown cases.

I have purposely omitted giving many statistics in this paper because I wished to present them in the following tables.*

TABLE 1.—Tuberculosis Case-Finding Surveys

Place	Number Tested	Positive	Number X-rayed	Latent Disease	Observation (Suspicious)	Active
Onondaga Co. (Brayton)	7,237	Grade 25% High 30%	1,866	397 21%	21 1.1%	29 1.5%
Chautauqua Co. (Rathbun)	30,000		7,171 High 7.5%	538	50 0.8%	310 4.3%
Massachusetts (Chadwick)	400,000	28%	112,000		3.5%	1.6%
New Haven (Edwards)	6,393	Not tested	6,393 Paper film		463 14%	415 6.4%
Sussex Co., New Jersey			692		205 30%	30 4.3%
Hampton, Va.			475	205 43%	50 10%	10 2.1%
N. Carolina (McCain)	25,048	5,659 27.6%	4,707		674 12%	431 7.62%
Syracuse (2 years)	4,281	1,448 34%	1,266	663 52.3%	127 10%	19 1.5%

Prepared from data available in April, 1937—shows comparative findings of surveys in eight localities.

Dr. Edwards, of New Haven, using paper films, x-rayed without first tuberculin testing and found 6.4% tuberculous. Using tuberculin test and then x-raying positive reactors, he found 12% active cases.

TABLE 2.—Tuberculosis Survey, Syracuse Schools—11th and 12th Grades
Tuberculin Test Summary—1934-1935

	Public Schools	Parochial Schools	Combined
Registration	3,278	487	3,765
Number tested	1,857—56.6%	302—62%	2,159—57%
Number read	1,848—99.5%	296—98%	2,144—99.3%
Positive	636—34.4%	109—36.8%	745—34.7%
Negative	1,212—65.5%	187—63.1%	1,399—65.2%

Syracuse Survey—first year showed slightly higher percentage of positive reactors in parochial schools—nearly 37%. The combined average of 34.7% is considerably more than the 23.5% who reacted positively this year (1938-1939) in the same grades.

TABLE 5.—Tuberculosis Survey, Syracuse Schools
Summary—Four Years

Grades and Year	Reg.	Tbn. Tests	Number Read	Pos.	Neg.	Number X-rayed	A	B	B2	C
11 & 12 1934-1935	3,765	2,159 57%	2,144 99.3%	745 34.7%	1,399 65.2%	629 84.4% of Pos.	214 34%	328 52.1%	76 12%	11 1.7%
8 & 11 1935-1936	3,553	2,122 52.7%	2,120 99.4%	703 33%	1,417 66.9%	637 90.8% of Pos.	243 38%	335 52.5%	51 8%	8 1.2%
10 & 11 1936-1937	5,201	2,358 45.3%	2,355 99.8%	843 35.8%	1,512 64.2%	771 91.4% of Pos.	364 47.2%	368 47.7%	32 4.1%	7 0.9%
9 & 10 1937-1938	6,690	3,753 56%	3,739 99.6%	1,124 30.1%	2,615 69.9%	1,058 93.2% of Pos.	444 42%	548 51.7%	64 6%	2 0.2%
Total	19,209	10,392 54.1%	10,358 99.6%	3,415 32.9%	6,943 67%	3,095 90.6% of Pos.	1,265 40.9%	1,579 50.9%	223 7.2%	28 0.9%

Class A—essentially negative. Class B2—suspicious of activity.
Class B—apparently healed childhood type. Class C —probably active.

Summary of four years' work—average response was 54.1% of registration—over 3,000 were x-rayed, 28 active and 223 suspicious cases were found. There has been a decrease each year in the number of active "C" cases found. This year, the fifth in our survey, there is also a marked decrease in the percentage of positive reactors.

TABLE 6.—Tuberculosis Surveys, Syracuse Schools
Summary of Positive Reactors—Four Years

Class	Without Contact, Symptoms or Family History	With Contact, Symptoms or Family History	Cont.	Symp.	F. H.
A 1,265	712	553	145 11.4%	465 36.7%	121 9.5%
B 1,579	689	890	318 20.1%	726 45.9%	279 17.6%

* Two tables omitted. Ed.

B2		77	146	68	136	59
M.	134			30.4%	60.9%	26.4%
F.	89					
	223					
C		3	25	11	22	12
M.	15			39.2%	78.5%	42.7%
F.	13					
	28					

Class A—essentially negative. Class B2—suspicious of activity.
Class B—apparently healed childhood type. Class C —probably active.

It is to be noted from this table that although the highest percentage (39.2%) giving a history of contact were "C" cases, the remaining larger number of cases in this group (60.8%) would have been missed if our efforts were confined to examining known contacts. This is true also for the B2, or "suspicious" cases.

Discussion

DR. RALPH HORTON, *Oneonta, New York*—I wish to compliment Dr. Ayling on the way he has gone about this work in the Syracuse schools and on the conclusions he has reached. I shall confine my remarks to the case-finding aspects of this subject.

The hospital with which I am associated serves nine rural counties in upstate New York and provides a consultation diagnostic clinic service for patients and their physicians throughout that district. In case finding, we have been primarily interested in those cases that are, or may become, spreaders of tubercle bacilli. This practically limits us to cases of the reinfection or adult type of the disease. The primary, or childhood type infections that we see in children, we regard as a challenge to us in locating the source of their infections, as it is these spreaders in whom we are most interested. While some of the childhood type infections may require treatment, most of them do well if the contact is broken, and in many it is merely an incident of past history and of little present clinical importance. Our experience has been that we can find more cases of tuberculosis by the examination of adults, particularly contacts, patients with suspicious symptoms, those in certain industries, and those in the lower economic groups, than by any other method. In these patients we find the chief value of the tuberculin test in differential diagnosis and as a guide to a certain extent in determining how frequently and for how long contacts should be periodically examined. If contact with the source case is permanently broken, we believe that negative reactors can be discharged from further supervision.

Through our clinics we have provided x-rays for the reactors of tuberculin tests that have been made by school physicians and county medical societies in eight of the nine counties of the hospital district. Perhaps because we are dealing with schools in smaller communities than Dr. Ayling's group, our percentage of reactors among high school juniors and seniors has been slightly less than his—27 per cent in our series. The yield in cases of reinfection type pulmonary tuberculosis was 0.1 of 1 per cent in this group. One would think from a study of the morbidity and mortality statistics that the age group of high school juniors and seniors would yield a significant number of cases of reinfection type tuberculosis. Pos-

sibly the reason we do not find them is that in many instances the cases in this age group have already been discovered through the operation of a diagnostic service that provides x-rays of contacts and patients with symptoms.

When all school grades were tuberculin tested, we found only 19 per cent reactors, and the yield of cases so small that we came to the same conclusion as Dr. Ayling—that from a case-finding standpoint, it is not worth while to include grades below the high school juniors and seniors. The morbidity and mortality statistics may explain this. Tuberculosis is a relatively benign disease among grade school children, and of all the deaths from tuberculosis, only 3.4 per cent of them occur in those under 15 years of age, and the majority of these are in infants and preschool children.

In the examination of school faculties and employees, we sometimes omitted the tuberculin test and x-rayed the entire group. We found 0.6 of 1 per cent of this group to have active pulmonary tuberculosis—six times as much tuberculosis as in the pupils. We consider the examination of this group one of the most important in a school tuberculosis program, not only for case finding but from the standpoint of education and public health.

DR. JOHN H. KORNS, *Olean, New York*—Dr. Ayling has, I believe, correctly appraised the value of the tuberculin test among school children, at least here in the North, whether old tuberculin or purified protein derivative be used.

When a school health director makes use of modern means to find any active tuberculosis that may be present among the pupils, he is to be commended. His methods may not be perfect. In fact, no method so far has been found to be perfect as a case-finding procedure. If I call attention to the limitations of Dr. Ayling's program, it is not because I would do the job differently were I in Dr. Ayling's place. That there are limitations, however, is evident.

Not all young people reach the junior class in high school. Many drop out during the earlier years. Those who drop out, and usually they would be in the lower economic group, would not be reached by Dr. Ayling's program. Moreover, with all the splendid preliminary educational effort that Dr. Ayling makes, only 54 per cent of those juniors and seniors enrolled consented to tuberculin testing. Presumably those not tested were not x-rayed.

Retesting annually of nonreactors is good but not good enough. As an illustration I may cite an experience in Cattaraugus County during the school year. A family moved into the county from Indianapolis with one daughter aged 18 who had a cough. Fortunately a physician suspected tuberculosis. Her sputum was positive. Within a week she was in the sanatorium. The brother and two sisters showed strongly positive tuberculin reactions. This girl might have entered school and infected a number of other pupils before the routine annual tuberculin testing and x-raying would

have discovered her. This emphasizes Dr. Ayling's very good point that much of the success of case finding must depend on the family physician.

Dr. Ayling found in Table 6, among contact reactors, 2.0 per cent who probably had active tuberculosis, but among noncontact reactors only 0.2 per cent. In other words, had an official or nonofficial case-finding agency properly x-rayed all contacts, this 2.0 per cent would have been discovered routinely. In Cattaraugus County, where contacts have been consistently followed, the routine x-raying of juniors and seniors in high school has been practically abandoned, since so few cases, other than those found through the examination of contacts, have been discovered.

Where the tuberculosis death rate is only 29 per 100,000 as in Syracuse, one would expect the infection curve and the attack rate to be low during adolescence. Dr. Plunkett, of the State Department of Health, and others, on the basis of experience, urge that more emphasis be laid on case finding among adults, since the incidence of pulmonary tuberculosis increases with age. Our Cattaraugus County experience leads us to emphasize this also. In so far as this affects the school program, it would lead to stressing the x-raying of teachers and other school employees. I suppose Dr. Ayling sees that this is done, though he has not mentioned it in his paper. In Cattaraugus County in the past year, out of about 100 teachers x-rayed 3 were found to have significant pulmonary tuberculosis. Two of these are now in sanatoria. The third is being allowed to continue under observation, as the lesion seems to be stabilized.

Where the tuberculosis death rate is high and there is no adequate case-finding agency operating in the community at large, a school program such as Dr. Ayling's will discover a good many cases of tuberculosis that would otherwise be missed. When the death rate is low, and such community case-finding procedures are provided for, the justification of a separate school program may depend on the cost per diagnosis.

References

1. Pottenger, F. M.: Health Magazine (March) 1939.
2. Lumsden, Dearing, and Brown: Am. J. Pub. Health, pp. 25-33 (Jan.) 1939.
3. Harrington, F. E., Myers, J. Arthur, and Levine, N. M.; J.A.M.A. (April 17) 1937.
   New York Health Department: Health News, p. 47 (March 29) 1939.
4. Rathbun, Walter L.; Tuberculosis among High School Students, Health in High Schools, p. 11, National Tuberculosis Association.
   Edwards, H. R.; M. J. & Rec. (Aug.) 1933.
   Myers, J. Arthur, Minneapolis: Lymanhurst — Report of Ten Years of Activity, 1932.
5. National Tuberculosis Association—Diagnostic Standards, p. 12.
6. Ryan, W. J.: J. School Health (Nov.) 1938.
7. Lees, H. D.: J. School Health (Nov.) 1938.
8. Korns, John H.: Am. J. Pub. Health, p. 167 (Feb.) 1938.
9. Pomeroy, J. L.: Annual Report for Year ending June, 1938, Los Angeles County Health Department California.

TUBERCULOSIS IN CHILDREN*

DR. PHILIP E. SARTWELL

Assistant Director, Division of Tuberculosis, Massachusetts Department of Public Health

Several different phases of tuberculosis, of widely differing importance and significance, are frequently recognized as a result of modern methods of investigation. The first, tuberculous infection as indicated by a positive tuberculin test without any evidence of disease in the lungs or other parts of the body, need not be viewed with alarm except in infants and young children. However, an attempt should be made, especially in children up to the age of ten or twelve, to determine the source of the infection. The second phase, primary lesions of the lungs or hilum lymph nodes, bears the designation "childhood type tuberculosis;" it is very seldom encountered in an active stage, the lesions usually appearing as dense calcified nodules. This is due to the first invasion of the tubercle bacillus into the body and, when healed, has much the same significance as a positive test except that it may suggest more intense and prolonged exposure. There is evidence that both infection and childhood-type disease, either by themselves or because they indicate exposure to tuberculosis, carry an increased hazard of subsequent breakdown from serious forms of the disease; hence it is wise to keep such children under observation. Children with childhood-type disease seem to break down more often than those with infection but with negative chest films. Furthermore, while most primary infections follow the course described above, by no means are all as benign as this. Occasionally, a child will develop progressive fatal forms such as miliary tuberculosis or tuberculous meningitis.

The third commonly met phase is true adult-type pulmonary tuberculosis. Through studies made by this department and many other sources, it is now coming to be appreciated that the typical course of the disease in this age group is as follows: a small infiltrative lesion develops, usually near an apex, and remains latent or progresses very slowly for a period often of years during which the child has no symptoms and no physical signs of illness, and the disease can be discovered only through routine x-raying of school children. In time, however, usually during adolescene, this type of lesion spreads to a point where it produces the classical picture of tuberculosis. In the second decade of life, girls are more often the victims of pulmonary tuberculosis than boys, and their disease has a greater tendency to be progressive. It is very important to find cases early while still in the latent asymptomatic period for two reasons: first, because the chance of recovery under sanatorium

* Reprinted from Contact, Massachusetts Department of Public Health, October, 1939, p. 4.

treatment is much better than later, and second, because the child is thereby removed from the possibility of infecting his associates.

An effective program for control in the schools based on our present knowledge of tuberculosis would include the following: First, the requirement that teachers and other school employees in contact with children have x-rays of their chests as a preliminary to employment. Second, a schedule of tuberculin testing of pupils and x-raying of reactors so that every child may have an opportunity for such examination at least once during his public school years, preferably a year or two before their completion. This work is best done by physicians experienced in tuberculosis and in the interpretation of chest films. Third, attention to the hygiene and general health of pupils: provision of nutritious lunches; special care for individuals needing it; correcting physical defects; restriction of classroom hours and outside work to safe limits. Fourth, the education of children to an intelligent understanding of the disease, in order to replace blind fear with healthy respect. This process should of course begin with the teachers. Fifth, if funds and personnel permit, a "source finding" program may be suggested; young children are tuberculin tested soon after entering school and the families of the reactors are searched for previously unrecognized cases of tuberculosis.

Emphasis should also be placed on the use of pasteurized milk from tuberculosis-free herds in the prevention of extrapulmonary forms due to the bovine tubercle bacillus.

The principles in the above program are: (a) prevention of exposure to the tubercle bacillus; (b) early diagnosis of tuberculosis. The treatment of the disease, once it has been found must be left to the family physician and the sanatorium staff. Sanatorium treatment is nearly always advisable, and collapse therapy is often of great value. The details of the preventive and diagnostic program must be worked out by the local authorities; effective case-finding depends upon the availability of portable x-ray equipment, well-trained and interested field workers, and sanatorium facilities to care for the diagnosed cases. One essential for good work is complete cooperation between health department, school department, and the voluntary Tuberculosis Association.

The following public facilities in Massachusetts are available for children of school age: The State Health Department, county sanatoria and local health departments conduct school clinics of the type described above, throughout the state; summer camps are maintained by the county health associations for children needing special protection against tuberculosis; and the North Reading State Sanatorium is reserved for children under 17 years having pulmonary or childhood-type tuberculosis. In addition there are many board of health clinics, hospital clinics, and sanatorium outpatient departments for observation and diagnosis.

EDITORIALS

The annual meeting of the American School Health Association has just been completed at Pittsburgh, Pennsylvania, the Association meeting in conjunction with the American Public Health Association.

The attendance at session meetings, the quality of the papers presented, and the enthusiasm of those who attended indicate that this was one of the most successful annual meetings the Association has ever had.

The meetings of the Governing Council were very well attended. Discussion was along lines that indicate a deep and sincere interest on the part of the members of the Governing Council in the welfare of the Association. Several progressive acts were taken. In the December issue of *The Journal* there will be published a more detailed account of the activities of the Governing Council.

The new President, Charles L. Outland, M.D., will make us a fine leader. Elsewhere in this issue is a statement of his qualifications.

The President-Elect, Amos L. Beaghler, M.D., Director of School Health Service, Public Schools of Denver, Colorado, has had a long experience in school health work and in work for better health for children. He is a past Chairman of the Child Hygiene Section of the American Public Health Association, and has the liking and respect of that Association.

It was voted that retiring presidents should be members of the Governing Council for a three year period following the ending of their term as president.

The financial condition of the Association has steadily improved. The debt which had been accumulated before the present administration went into office three years ago, and which has been such a weight about our necks, has been fully paid, and there are sufficient funds and bills receivable to pay for the printing of the November and December *Journals*. The printing of the *Journal* is, of course, our major expense.

In 1934 there were in the United States only a few above 5000 cases of smallpox. Since then there has been a rapid increase. In 1937 there were 11,673; in 1938 almost 15,000.

These figures indicate that, with the exception of India, smallpox is more prevalent in the United States than in any of the nations of the world. "In 1936 (last available worldwide figures), according to reports of the Health Organization of the League of Nations, England and Wales, with a population of 40,839,000, reported only 12 cases; France, with 41,906,000 population, reported 273 cases; and Germany, with a population of 67,346,000, reported no cases."

Massachusetts has a particularly fine record in the matter of the incidence of smallpox. The last case reported in that State occurred early in 1932. As early as 1809, less than 10 years after vaccination was introduced into the State, "a law was passed making it mandatory that each community appoint a committee to have charge of vaccination. At that time the virus was propagated by the arm-to-arm method, and unless someone had the responsibility of the continuous tranference of cowpox, the virus was not available for an emergency. For a time smallpox almost disappeared, and in 1837 the law was repealed. A gradual increase in unvaccinated individuals resulted, and by 1853 smallpox had become so prevalent that the legislature passed our present compulsory vaccination law."*

Since then the history of the disease in Massachusetts indicates that whenever a period of laxness is present, there is a marked increase in the incidence of smallpox, and whenever the health administration tightens up, the number of cases markedly decreases.

The high rate in the United States is due largely to the prevalence of the disease in the Great Plains and Pacific Northwest area. "In some of the states, notably North and South Dakota, Utah, Wyoming, Oregon, and Idaho, the case rate is among the highest reported anywhere in the world."

Of the thirteen States having compulsory vaccination laws, only two are west of the Mississippi.

Anti-vaccinationists, as an argument against vaccination, often present the claim that the diminution in smallpox in most of the civilized world has been due, not to vaccination against the disease, but to better sanitation and greater cleanliness in community and home. If their claim is true, isn't it a pity that some of our States are so lacking in sanitation and cleanliness? Is it not a peculiar coincidence that this lack seems prominent only in those States that do not have an enforced effective compulsory vaccination law?

* * * * *

Cod Liver Oil,—Some authorities recommend that cod liver oil be given in the morning and at bedtime when the stomach is empty, while others prefer to give it after meals in order not to retard gastric secretion. If the mother will place the very young baby on her lap and hold the child's mouth open by gently pressing the cheeks together between her thumb and fingers while she administers the oil, all of it will be taken. The infant soon becomes accustomed to taking the oil without having its mouth held open. It is most important that the mother administer the oil in a matter-of-fact manner, without apology or expression of sympathy.

If given cold, cod liver oil has little taste, for the cold tends to paralyze momentarily the gustatory nerves. As any "taste" is largely a metallic one from the silver or silverplated spoon (particularly if the plating is worn), a glass spoon has an advantage.

CHARLES L. OUTLAND, M.D.

The new President of the American School Health Association is Charles L. Outland, M.D., of Richmond, Virginia. Dr. Outland was born at Woodlawn, North Carolina, in 1891. He attended public school, and private preparatory school in Pennsylvania. He graduated from the Medical College of Virginia in Richmond in 1917. Since then he has taken a special course in public health at John Hopkins University, and has a certificate of successful training in public health from the graduate school of Columbia University.

1919-1920, County and City Health Officer in three counties in North Carolina.

1921-1922, in Europe with the American Relief Commission in the Balkans.

1922-1923, in special work with the State Board of Health of North Carolina in malarial control.

1923-1926, City-County Health Officer, Greenville, North Carolina.

1926-1932, Chief Epidemiologist, Health Department, City of Richmond.

Since 1932 he has served as Medical Director of City Schools in Richmond, Virginia. a position he held until Retirement

He is a Fellow of the American School Health Association, of the American Public Health Association, and a member of his County, City, and State Medical Societies, of the Southern Medical Association, and of the American Medical Association.

The American School Health Association is fortunate in having as its leader for the coming year a physician with such a broad training and experience in the field both of school health and of public health.

* * * * *

A LETTER FROM THE PRESIDENT

To the Members of the
American School Health Association:

May I take this method of expressing to you my sincere thanks for the confidence placed in me by your election of me as your president for the coming year. In return I wish to ask your continued support of this organization. Please feel free to offer suggestions for the improvement and extension of this important work. I sincerely believe that any efforts made for the improvement and advancement of School Health will bring large returns. This can be brought about by the continued effort of each of us in our varied fields.

Very sincerely,

C. L. OUTLAND, M.D.,
President

ABSTRACTS

SCHOOL PHYSICAL EXAMINATIONS*

Discovery of Defects Not the Only Value of the School Physical Examination,—It is too often assumed that the detection of physical defects is the only objective of the periodic examination of school children. Undoubtedly, this is one of the most valuable features of this procedure, and when the discovery of defects is promptly followed by measures for correction, an immense amount of good is accomplished.

School Physical Examination of Value as a Health-Education Experience,—There are, however, many other values inherent in this examination. The physical examination of school children by a school physician is health-education experience of major importance. In the first place, a favorable attitude is developed toward the fundamental idea of having one's health appraised by competent physicians at regular intervals. The dental profession has made commendable progress in educating the public to prevent dental trouble by consulting the family dentist at regular intervals. One of the next great steps forward in preventive medicine will be made when the public are brought to realize that a periodic check-up of nutrition, heart, lungs, kidneys, etc., by the family physician is just as important as the semi-annual visit to the dentist.

In the second place, favorable attitudes toward health itself may be established. The school physician does not merely point out the defects which are discovered, but rather commends the fine points in the physique of the child who is being examined. Very often a small spark of self-respect is thus fanned into a glowing purpose to achieve optimum health. Many physical imperfections, especially those that result from faulty health habits, may be corrected by presenting to the child a health ideal, and describing in simple terms the road by which this ideal may be attained. In the physical examinations of school children the school physician has the advantage over all other school health workers, inasmuch as he is a doctor and as such speaks with authority on health matters. Even as early as the kindergarten age most children have been conditioned to accept the authority of physicians on matters of health. This creates a great opportunity and a great responsibility.

The Carry-Over Value of the School Physical Examination,—In recent years our school program is being evaluated on the basis of its carry-over value into adult life. The public are asking, "Are the school educational experiences fitting our young people to step out into life and meet its challenges?" The school physical examination is educating our children to keep their bodies fit by living in accordance with the laws of health and by seeking advice at

* Reprint from California and Western Medicine, January, 1939, Volume 50, Number 1, 450 Sutter Street, San Francisco.

regular intervals from competent physicians and dentists. This is "carry-over" of an enduring character.

School Examinations Help to Indicate Health Values of the School Program,—Furthermore, as Chenoweth and Selkirk have recently pointed out, "even though competent service is given some children by personal physicians, the school examinations are still of value in giving a picture of the health of the school as a whole, and in showing the effect of the school program for good or ill. They may indicate the need for radical reforms in such matters as hours of attendance, periods of rest and relaxation, the school midday meal, the amount of home work, and other parts of the program."[1] The other parts of the program referred to above might well include the physical education program. The physical examination of school children, if adequately performed, should provide information as to the soundness of these activities. Are we placing the emphasis on the right type of activity? Are the present basketball rules resulting in a game which is too strenuous for the adolescent boy? Are too much time and effort being devoted to football? Would emphasis on other athletic activities have greater health values? Help in solving these problems should be obtained from careful physical examinations by skilled school physicians.

The Function of the School Physician Is Health Supervision and Health Education,—School physicians are sometimes criticized for not making definite diagnoses in connection with obscure conditions affecting school children. The public forgets that private physicians in similar cases only make a diagnosis after a complete physical examination, together with most exhaustive laboratory investigations. School physicians, from the nature of their work and experience, become expert in observing the normal growth and development of children. They are alert to detect slight deviations from normal, the earliest symptoms of physical abnormality or disease. In such cases only time or the complete laboratory service at the disposal of the family physician or clinic will elucidate the diagnosis. The school physician is not in the school to take the place of either the family physician or the clinic physician; he is there to guide the children along the road to health. Along this road the family physician and dentist are exceedingly important in providing personal supervision of health and physical rehabilitation by treatment when necessary.

Chenoweth and Selkirk have admirably analyzed the situation as follows: "The school examination aims not at making diagnosis, but at pointing out the need for medical supervision when necessary. Its purpose is not to provide advice as to treatment

[1]Chenoweth and Selkirk: School Health Problems, p. 154. F. S. Crofts & Co., Inc., New York, 1937.

even for the indigent class, since this consumes too great an amount of time and is more efficiently handled by other means. The health examination is essentially an effort in health education to establish suitable attitudes in the child and his parents, and to act as a motivating force for healthful living. By the school examination, however, masses of children are examined who would otherwise be passed by, a multitude of defects are discovered which would otherwise pass unnoted, and correction is instituted in vast numbers of cases." [2]

Physical Findings of Physicians of Value to the Classroom Teacher,—A great deal of the value of the school physical examination may be lost if the information obtained by the school physician is not made available to the teachers. Every effort should be made through health coordinators, or someone functioning in that capacity, to see that the findings of the school physicians are passed on to the classroom teacher. Defects of vision, hearing, heart, and malnutrition, etc., create classroom situations and problems which can only be handled intelligently when the information obtained by the physician is made available to the teachers.

C. MORLEY SELLERY, M.D.,
Los Angeles.

* * * * *

Tuberculosis, Early Diagnosis,—The reduction of tuberculosis mortality in recent years may be phenomenal, but deaths from tuberculosis still hold seventh place in Massachusetts and in the nation as a whole, and only a pitifully small number, 13 per cent, of cases are recognized in the minimal stage when treatment is most effective.

What are the causes of this sorry state of affairs? Three factors would appear to play a part. First, there is the casual disregard of early signs and symptoms of tuberculosis by the examining physician. It is of interest that in a study of the records of 340 patients with tuberculosis, Maxwell[1] found the average duration of significant symptoms before the recognition of the disease to be a year. In 85 of these there was a history of pleurisy which had been disregarded. Pleurisy has been classed by Jaquerod[2] with initial hemopytsis, as a "happy accident" calling attention to the need of treatment while the prognosis is still good.

Are we as a profession overlooking the fact that unexplained pleurisy with effusion usually means active tuberculosis of the pleura and requires treatment as does any other form of tuberculosis? Do we bear in mind that in young women the age group from eighteen to twenty-five years carries with it the highest incidence of tuberculous disease and that with men the age group of

[2]Chenoweth and Selkirk: School Health Problems, p. 155. F. S. Crofts & Co., Inc., New York, 1937.

highest morbidity is from twenty-six to thirty-two? We know that mass surveys with tuberculin testing and the x-raying of positive reactors yield the earliest possible diagnosis of minimal tuberculosis. But do we apply that same method of early diagnosis to small units such as the family where there is suspicion of disease or known exposure to it? We know as physicians that tuberculosis is spread by contact. But do we make an effort to pursue all those people closely associated with known cases to find the "open" source of infection, or to detect early disease in other contacts? We have learned in recent years that tuberculosis is more prevalent among medical students, nurses, and other hospital workers than among those whose contacts with the disease are less frequent. But do we give these groups individually the benefit of this knowledge in the needed attention of a periodic clinical and x-ray check-up? Editorial, The New England Journal of Medicine, Sept. 7, 1939, p. 395.

1 Maxwell, J.: Earlier Diagnosis of Pulmonary Tuberculosis with Reference to Symptoms. Lancet 1:186, 1937.

2 Jaquerod, M.: La pleurésie séreuse dite primitive; son importance clinique. Schwiez. med. Wchnschr. 19:746, 1938.

* * * * *

Tuberculous Teachers,—"Hidden tuberculosis, the most dangerous of all because it is an enemy in ambush unknown alike to the victim and others exposed thereto, was brought to light in 26 out of 2818 student-teachers examined last summer by the State Department of Public Health at three of the State Normal Colleges," according to a recent edition of the Health Officers Bulletin. "These 26 persons, mostly local school teachers taking advanced courses at the summer session, were found by x-ray evidence to be suffering from chronic pulmonary tuberculosis. Mostly innocent of their tuberculous condition, these persons occupied positions, or expected to, which endangered large numbers of children by daily exposure to infection.

"The x-ray evidence was suggestive though not conclusive of active pulmonary tuberculosis in another 23 of the students examined. These need to be under professional observation during the next few years so that any developments toward active tuberculosis may be detected soon enough to prevent the exposure of others and to make possible appropriate treatment at the most advantageous time.

"Altogether, the tuberculin skin test was done on 2818 persons, mostly student-teachers but including a few faculty members and others, at three of the State Normal Colleges. Of the total, 1073 or about 38% were negative to the skin test. X-ray pictures of the chest were done on 1621, a few of those being on negative reactors who requested the x-ray while 124 positives had no x-ray for one reason or another. The 26 cases of active pulmonary tuberculosis discovered gave a rate of 16 per 1,000 among those x-rayed (mostly positive skin reactors) and a rate of about nine per 1,000 among all those examined.

"This study indicates that approximately one in each 100 down-state school teachers of Illinois is suffering from chronic pulmonary tuberculosis. Since there are approximately 33,000 public school teachers in Illinois exclusive of Chicago, it would appear that some 300 would show evidence of active pulmonary tuberculosis upon x-ray examination of the chest." The Contact, June, 1939. Published by the Illinois Tuberculosis Ass'n.

* * * * *

A Survey of Tuberculosis?;—Statistical facts are one thing, their proper interpretation another. The Gallup Survey asked certain questions about tuberculosis. The National Tuberculosis Association has commented on this poll through their Health Education specialist, Dr. Harry E. Kleinschmidt, in the Bulletin of the National Tuberculosis Association for August, 1939. Dr. Kleinschmidt warns us against "the tyranny of that mystic symbol %;" but he also recognizes these statistics as "an extremely valuable contribution" and he says: "the wise tuberculosis worker will view this poll as a valuable guide and not as a precise formula on which to base his educational campaign."

As school health workers, we should consider and re-consider the relation of health education to tuberculosis control, and now we must try to understand the meaning of the responses to these questions. We know there is good evidence which indicates that the American Institute of Public Opinion survey procedure reveals a cross-section response to the questions. We have, then, the response we should get from ordinary Americans all over the United States. What do they mean concerning the efficiency of health education for tuberculosis control?

The responses to the question: "What do you think is the cause of Tuberculosis?" were as follows:

Germ	18%
Run-down condition	17%
Malnutrition	13%
Poor living conditions	12%
Bad heredity	11%
Exposure to weather	11%
Bad food	8%
Colds	6%

Other causes named included weak lungs, impure air, too much drinking, wet feet, cattle, too much smoking, worry, lack of vitamins.

When Dr. Kleinschmidt warns against "the seeming exactness of statistics," we should not allow such warnings to lull us into a smug discarding of facts that might help us understand any weakness of the National Tuberculosis Association educational program or any failure of health education in the schools. It is obvious from these figures that the contributing factors such as —

"run-down condition," "malnutrition," "poor living conditions" are frequently thought of as causes. We know that the control of the channels of infection cannot be achieved by directing efforts to "malnutrition" or "run-down condition." We must have intelligent understanding of the way the disease is transmitted if we are to control the channels of infection. In a democracy the public must cooperate to control tuberculosis infection. How can they cooperate if they are confused as to the cause? With all Dr. Kleinschmidt's warnings against % figures, he also says: "what the poll does reveal *without any doubt* is that there is confusion in the minds of the people." So it is apparent that our health education has not succeeded in providing the understanding of the cause of tuberculosis that is essential for the control of tuberculosis infection. We cannot carry out the measures for control of infection as we should when the people are confused. Dr. Kleinschmidt says: "To know *how* tuberculosis is communicated is quite as important as to know what it *is*." So the answers to this Gallup question reveal very clearly a *phase of health education that can and should be improved.* Where there is confusion in the minds of the people the tuberculosis control program will be seriously handicapped. Other questions of this Gallup Poll indicate very clearly that there has been progress made through the general public health education program of the National Tuberculosis Association, but we have much to accomplish to teach how the disease is transmitted. I believe this interpretation of the Gallup data will be approved by anyone who comes in contact with the public so as to learn the average man's understanding of how tuberculosis is transmitted.

The discerning physician, the public health nurse, or the social worker who frequently discusses tuberculosis with many kinds of people, readily recognize the difficulties the average person has in comprehending the essential facts about the epidemiology of tuberculosis. They know also the need for education for different attitudes. For example, most teachers oppose x-ray of chest when it is first proposed to them. The teachers must be trained to understand how the tubercle bacillus is spread, how it kills and how we should guide children to understand this important information. And still more—the teachers must be trained to influence attitudes about tuberculosis control.

The Gallup figures can certainly be interpreted as an indication of failure to a certain extent to teach the public what they should know about tuberculosis. They present a challenge for more effective health education in the schools. Harold H. Mitchell, M.D.

* * * * *

An Educational Health Examination,—It is generaly recognized that the school health examination has health education as its major objective. It should therefore provide an opportunity for the child to accustom himself to the routine of an examination. It

should develop favorable attitudes toward health matters in general, in addition to a definite knowledge about himself. It should be an appraisal of the status of the whole child rather than limited to a discussion of wrong features only. Often there are many "right" things in the development of the child which need to be stressed.

The examination does not aim at complete diagnosis, nor does it provide advice as to treatment, but it should at all times make a serious effort to establish suitable attitudes towards health in its entirety. In this the classroom teacher can be of great help.

The teacher has a valuable contribution to make to the health examination. No one in the school program has a better opportunity to develop close relationships with the children. She can, for example, help the child and parent to see the relationship between an existing vision defect and a failure in reading ability or the relation of fatigue to lack of sleep. The data consisting of physical findings can help to vitalize all health instruction in the classroom.

All the procedures of the examination move along better channels of usefulness when adequate preparation is made in advance. If the children know when they are to have their examination they will be far more interested. Also, if they know what kind of examination is to be given they will not expect—as is often the case—an examination similar to that offered by the family physician. Likewise, parents should be carefully informed concerning the content.

Great enthusiasm for the health examination cannot be expected from busy parents unless its value in furthering their understanding of the child is sufficient to make it worth their while. The doctor and nurse can ill afford to neglect the courteous handling of the school health examination, for it is impossible to go very far toward correction unless the whole-hearted support of the parent and child is secured.

It is exceedingly important that the examination be a pleasant experience for the child. In an educationally effective examination the child receives courteous treatment. He is the center of the examination. It is most important for him to leave the examination with some assurance in regard to meeting his health problems. If emotions are disturbed by reason of the finding of special problems, a quiet talk later with the teacher, nurse, and child participating is to be recommended.

The nurse and doctor should be deeply sensitive to the learning situation which they are building up for the children. A critical examination of the educational techniques employed should be made by the professional staff to assure them that the health examination as conducted is the right kind of learning experience. Marion E. Stevens, R.N., Public Health Nursing, September, 1939, 482-485. Abstracted by Earl E. Kleinschmidt.

Communicable Disease Control,—Morning inspection means a quick inspection the first thing in the morning to be sure all children are free from communicable diseases. It may be an informal inspection by the teacher from the front of the classroom, or it may, in times of epidemic, include a formal, individual inspection of each pupil.

1. Select a well lighted place, preferably by a window.
2. Approach each child in a friendly manner, always from the standpoint of helping, not policing.
3. Have child remove extra sweater, coats, and rubbers; roll sleeves to elbows, open shirt or dress at neck.
4. With fingers apart, inspect palms and backs of hands for rash.
5. Have child open mouth wide and draw in breath so that throat may be observed for redness.
6. Watch for signs of fever. Flushed face is fairly good indication although every teacher should be able to use and care for a clinical thermometer.

Teachers should also check to see that child has clean handkerchief; that wraps are removed; that temperature of room is from 68 to 72 degrees F.; that the classroom is properly lighted; that children are comfortably seated; and that the classroom and playground are clean and safely equipped for the day.

The teacher excludes pupils from school on the basis of these signs. She never diagnoses.

1. Rash or skin eruption.
2. Red or inflamed eyes.
3. Inflamed or red throat.
4. Flushed face, signs of fever.
5. Running nose, sneezing, coughing.
6. Headache, pallor, nausea.

A chart, "Prevention and Control of Communicable Diseases," has been prepared especially for teachers and may be secured from your local health department or the Missouri State Health Department, Jefferson City.

Immunization programs should be arranged through county or district health officers and private physicians. Names and addresses of health officers will be furnished upon request to the State Department of Education or State Health Department, Jefferson City. Health Aids for Teachers, Department of Public Schools, Jefferson City, Mo., p. 1.

* * * * *

Education Needed,—Distinction between the relative importance of an ordinary environmental nuisance and a serious potential hazard to health appears to be far from clear in the popular mind. Hog pens located near dwelling houses, for example, inspire a much larger volume of correspondence to the State Department of Public Health than unsupervised milk supplies, while the burning of garbage invariably irritates the neighbors to a much greater

extent than a tuberculous school teacher. A householder will report his neighbor for maintaining a nuisance which involves a minor risk to health much more readily than for keeping secret from health officials a case of contagious disease such as scarlet fever, whooping cough, or tuberculosis.

In the course of a year, 500 to 600 letters are received complaining of nuisances and requesting State aid in their abatement. They relate mostly to garbage, hog pens, offensive odors from a variety of sources, smoke, rubbish, dust, etc. In general such nuisances have very little direct inimical effects on health and are fundamentally problems for the police rather than for health authorities to solve.

On the other hand, cases of communicable diseases are rarely reported except by physicians who see the patients although it is the legal duty of anyone with a knowledge of a case to report it. Epidemiological investigations by the Department reveal repeatedly that the existence of cases of tuberculosis, sore throat, scarlet fever, whooping cough, and other diseases have been common knowledge in communities long before reports reach the health authorities.

In one rather recent case, for instance, it was generally known in the community that a school teacher had been suffering from tuberculosis for years. Her death attributed to that disease brought the matter to the attention of health authorities for the first time, and led to an investigation which uncovered several other cases that apparently resulted from contact with her. It is rather common to find upon investigation of a reported case of communicable disease that several other persons in the vicinity had been suffering from similar illness and that the infection had spread from a source that might readily have been eliminated if the first case had been reported promptly.

Human beings are the primary and most common sources of those infections which are most prevalent and most dangerous to health and life—tuberculosis, pneumonia, syphilis, whooping cough, scarlet fever, diphtheria, etc. Hog pens, refuse dumps, malodorous gas-escape vents, incinerators, and the like are highly disagreeable and undesirable nuisances when located near dwelling houses, but they are of much less potential danger to physical health than a typhoid fever carrier, or a scarlet fever patient with a mild attack of that disease who handles raw milk, for example.

Seasonally, the importance of prompt and complete reports of cases of communicable diseases will increase rapidly during the next few weeks. Practically all of the respiratory diseases—scarlet fever, diphtheria, measles, pneumonia, colds, influenza—begin to rise in prevalance in September or October. Every case that escapes notification increases the likelihood of the spreading of these diseases. Illinois Health Messenger, Sept. 15, 1939, page 118.

The Effects of Basketball on Junior High School Boys,—The adoption of the ten second rule in basketball thus eliminating the center jump has provoked much discussion. Opinions vary widely as to the desirability or undesirability of this practice, especially when applied to boys of the junior high school level.

In a study extending over a period of four years, the writers came to the conclusion that basketball as played with the present rules is too strenuous for junior high school boys unless, they add, several boys (substitutes) participate in the game. The basis for their opinion is found in extended pre-season and post-season tests consisting of pulse rates and blood pressure readings. Care was taken that these determinations were taken under as ideal circumstances as possible.

It was early noticed that pulse rates and blood pressure readings of boys who did not play the full game would return to normal very quickly after the game. From this, they deduced that a full game of basketball was too strenuous on junior high school boys. Hard games invariably produced increased pulse rates and blood pressure readings when compared with easy games. Recovery time was also prolonged. Post season tests showed increased heart rates with lower blood pressure readings. These findings, they point out, indicate periods of fatigue that place a strain on the circulatory system. A. B. Bowyer, B.S., M.D., and N. S. Anderson, A.B., M.S. The West Virginia Medical Journal, 35 (February, 1939), pp. 1-8. Abstracted by Earl E. Kleinschmidt.

* * * * *

Health Instruction Required,—Hereafter, at the University of Cincinnati, all those in training for teaching will be required to take 12 semester hours in health and physical education—six in personal hygiene and community health, two in service courses, and four in professional methods courses.

While some 17 years ago the State Normal Schools in Pennsylvania established a larger requirement than this, the standard was not kept. This Cincinnati standard is encouraging.

* * * * *

Modern Hygiene,—

"To be healthy don't eat any kind of food."
"The liver is an infernal organ of the body."
"One of the main causes of dust is janitors."
"Heredity is a bad thing and ought to be prevented."
"The animal which possesses the greatest attachment for man is woman."
"A ruminant is an animal that chaws its cub."
"All brutes are imperfect animals—
Man alone is a perfect beast."

From "Boners," "More Boners" and "Still More Boners"—Alexander Abingdon Quoted in "The Readers Digest." Contact, Massachusetts Department Public Health, October, 1939, p. 7.

REVIEW

Dental Hygiene. A Guide to the Dental Hygiene Program in the Schools of New York State. Health Education Series, Bulletin No. 4. The University of the State of New York Press, Albany, New York. 1938. pp. 30.—The purpose of this guide is to provide materials which will clarify and improve the program of dental hygiene in the schools of New York State. It is intended for the use of dental hygiene teachers, school dental supervisors, superintendents, principals, and others having a part in the administration of the school health program.

Attention is directed mostly to four main subjects: 1. General facts and policies as applied to the school dental hygiene program; 2. Major aspects of dental hygiene, teacher's activities; 3. Responsibility for the school dental hygiene program; 4. Follow-up procedures and facilities. The bulletin is replete with photographs of actual programs in progress, and forms used to facilitate the work of the dental hygienist. Excellent suggestions are also incorporated for setting up a new program of activities.

This bulletin will be of especial benefit to the supervisor of school dental hygiene. New York State is to be congratulated on the excellent program it has developed. Public health workers in other states, and especially those interested in the promotion of dental health, can profit immeasurably from reading this excellent guide. Earl E. Kleinschmidt.

BOWMAN'S
SOFKURD
VITAMIN D MILK

SofKurd milk is regular milk in which the minerals have been re-arranged by a scientific process so that it remains liquid throughout digestion.

Thus by making milk even more digestible, its wholesome food value becomes even more available to nourish the body.

SofKurd contains Vitamin D, this assuring a better use of the minerals, especially calcium and phosphorus, which are made more available in SofKurd.

BOWMAN
DAIRY COMPANY
Chicago, Ill.

CHRISTMAS SEALS

Help to Protect Your Home from Tuberculosis